南大洋季節海氷域におけるマリンスノー食物網の解析：計画と事前検討

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Research plan and prior examination for analyzing marine snow food web in the marginal sea ice zone of the Southern Ocean

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Marine snow is the general term for sinking particles, including dead organisms, fecal pellets and inorganic matters. There are various types of marine snow in sizes, shapes, compositions and chemical properties. Marine snow is the main driver of the biological carbon pump and the foundation of the ecosystems in the mesopelagic zone. In the Southern Ocean ecosystems, key species, krills and myctophid fishes, are closely related to mesopelagic ecosystems. Therefore, investigation of the food web structure in mesopelagic zone is important to understand the ecosystem structures in this region. Recent studies have suggested that the selective feeding by zooplankton on particular types of marine snow in the mesopelagic zone, for example, selective feeding on phytodetritus (Sano et al. 2013). Understanding selectivity of marine snow feeder will be important for estimating consumption of marine snows by zooplankton in their sinking processes and food web structures in the mesopelagic zone. It has been also suggested that diversity of marine snow is largely related to biodiversity of marine zooplankton. However, little is known about the food web between particular types of marine snow and zooplankton because of the difficulty on the analyses, for example, collecting individual marine snows and identifying their components. The purpose of our study is to examine the feeding habits of zooplankton, focusing on their selective utilization on marine snow. In this year's survey of the Southern Ocean by the training vessel *Umitaka-maru*, the drifter equipped with newly introduced gel-filled sediment traps in epi- and mesopelagic layers will be deployed over 24 hours for collecting individual marine snows. Zooplankton samples will be collected using several types of plankton nets. Collected individual marine snows and gut contents of zooplankton will be analyzed with morphological and genetic approaches. We will introduce our plans and show the results of prior examinations.

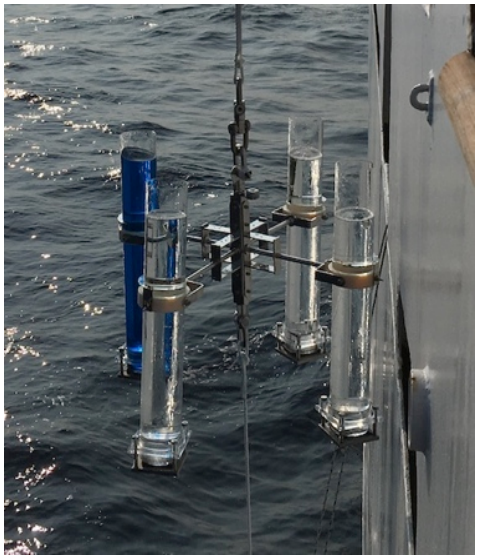

Figure 1. Gel-filled sediment trap

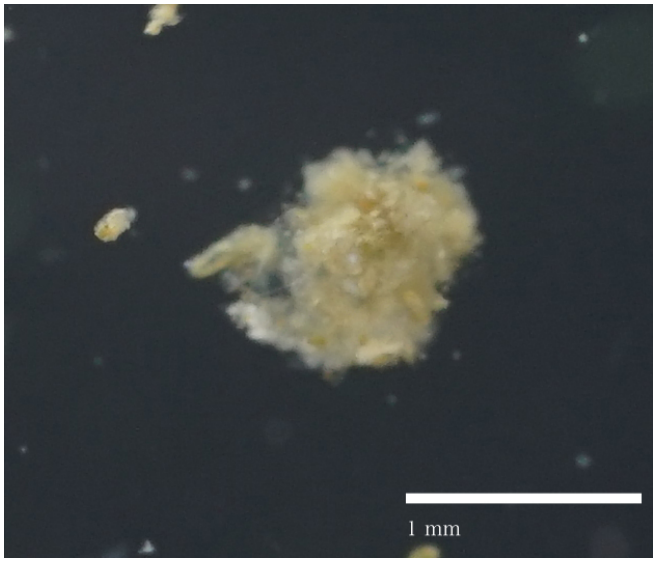

Figure 2. An example of marine snow collected by a gel-filled sediment trap.

References

Sano, M., Maki, K., Nishibe, Y., Nagata, T., Nishida, S. (2013): Feeding habits of mesopelagic copepods in Sagami Bay: Insights from integrative analysis. Progress in Oceanography, 110, 11–26.